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(1 of 1)

United States Patent Application**20050009160****Kind Code****A1****Chou, Amos ; et al.****January 13, 2005**

Novel biological approach for forming low-k dielectrics

Abstract

An intermetal or interlevel low-k dielectric layer is formed of the hardened cell walls of microorganisms that are filled with air or an inert gas. The method of formation comprises the formation on the substrate of a protective and adhesion enhancing layer. A culture medium is then applied to the protective and adhesion enhancing layer and seeded with living microorganisms. After the seeded layer has attained a desired thickness by growth and multiplication of the microorganisms, the medium is dried by air or an inert gas, sacrificing the microorganisms, hardening their cell walls and replacing their intercellular material with the drying medium. Finally, a capping dielectric layer is formed over the mass of cell material.

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Claims

Case Creation Option

Case "10615745us20060410" already exists. Please overwrite it or cancel the operation.

The Contents of Case "10615745us20060410"

Qnum	Query	DB Name	Thesaurus	Operator	Plural
Q1	microorganism and ((dielectric or di-electric) same Layer)	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q2	silicon near5 (algae near5 cell wall)	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q3	(silicon-di-oxide or ("SiO2")) near5 ("low-k-dielectric")	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q4	(silicon-di-oxide or ("SiO2")) and("low-k-dielectric")	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q5	dielectric layer	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q6	(silicon-di-oxide) or ("SiO2")	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q7	semiconductor	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q8	("low-k-dielectric")	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q9	silicon near5 microorganism	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q10	Q8 and Q9	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q11	Q1 and Q9	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q12	Q5 and Q6	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q13	Q7 and Q12	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q14	Q9 and Q13	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q15	Q1 and Q13	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q16	Q7 and Q8	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q17	biolayer or ((microbial or bacterial) NEAR5 LAYER)	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q18	Q8 AND Q17	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q19	Q5 AND Q17	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q20	Q16 AND Q19	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q21	Q9 AND Q19	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q22	Q2 AND Q19	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES

Q23	Q1 AND Q19	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q24	Q8 AND Q23	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q25	Q8 SAME Q9	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q26	Q11 AND Q17	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q27	Q11 AND Q23	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q28	Q1 AND Q17	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q29	Q8 AND Q28	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q30	Q7 AND Q28	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q31	Q16 AND Q30	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q32	Q19 AND Q30	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q33	(CULTURE OR GROWTH) NEAR5 MEDIUM	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q34	Q1 AND Q33	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q35	Q17 AND Q34	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q36	Q9 AND Q35	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q37	Q8 AND Q6	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q38	Q35 AND Q37	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q39	Q34 AND Q37	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q40	Q34 AND Q8	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q41	Q34 AND Q6	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q42	Q34 AND Q4	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q43	Q34 AND Q5	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q44	Q34 AND Q7	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q45	Q43 AND Q44	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q46	Q35 AND Q45	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q47	Q1 AND Q7	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q48	Q1 AND Q33	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q49	Q4 AND Q48	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q50	Q47 AND Q48	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q51	435/168.CCLS.	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q52	438/001.CCLS.	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q53	438/1.CCLS.	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES

Q54	Q51 AND Q53	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q55	Q50 AND Q51	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q56	Q50 AND Q53	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q57	Q56 AND Q9	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q58	Q50 AND Q35	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q59	Q51 AND Q58	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q60	Q53 AND Q58	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q61	Q54 AND Q58	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q62	Q55 AND Q58	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q63	Q1 AND Q58	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q64	Q4 AND Q63	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q65	Q6 AND Q63	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q66	Q33 AND Q63	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q67	Q9 AND Q66	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q68	Q6 AND Q66	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q69	Q7 AND Q66	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q70	COMPUTER NEAR5 (CHIP OR BOARD)	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q71	Q1 AND Q70	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q72	Q6 AND Q71	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q73	Q8 AND Q72	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q74	Q33 AND Q72	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES
Q75	Q17 AND Q72	PGPB,USPT,USOC,EPAB,JPAB,DWPI	None	ADJ	YES

Overwrite

Cancel